

Three new earthworms of the genus *Amyntas* (Megascolecidae) from Mt. Gyeryong, Korea

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Three new earthworms of the genus *Amyntas* (Megascolecidae) from Mt. Gyeryong, Korea. - Three new *Amyntas* with two pairs of spermathecae are described from Mt. Gyeryong, Korea: *Amyntas gyeryongensis* sp. n., *Amyntas gongjuensis* sp. n., and *Amyntas yeoi* sp. n. *Amyntas gyeryongensis* sp. n., and *Amyntas gongjuensis* sp. n. have spermathecal pores in 5/6, 6/7, and vi, vii, while *Amyntas yeoi* sp. n. has spermathecal pores in 6/7 and 7/8. The former 2 species have two pairs of spermathecae in vi and vii, and lack genital marking. The latter has paired spermathecae in vii, viii, and genital marking paired in vii and viii. Descriptions of the new species are provided, including illustrations of the ventral view, male pore region, and spermathecae.

Key-words: Earthworms - *Amyntas* - Megascolecidae - Oligochaeta - Mt. Gyeryong - Korea – taxonomy.

INTRODUCTION

This study is one of continuous studies on the earthworm fauna in various regions of Korea. Ms. Song's specimens mentioned in the previous report have been kept in the Department of Biology, Kyungbuk National University. Among them are specimens collected from Mt. Gyeryong, August 28-31, 1971 (E. D. Yeo & J. S. Son coll.). From 31 individuals, we describe herein three new species of *Amyntas*. Additional materials from Mt. Palgong and Mt. Mudeung were used in the description of *Amyntas gongjuensis* sp. n. These three new species are separated easily by the shape of male pore region from other *Amyntas* having two pairs of spermathecae in vi, vii (*Amyntas gyeryongensis* sp. n., *Amyntas gongjuensis* sp. n.) and in vii, viii (*Amyntas yeoi* sp. n.). Mt. Gyeryong reaches an elevation of approximately 845 m, and lies to the west of Daejeon city. Commonly several earthworm species are found in each small locality in Korea. Some examples are instances of new species found in the following locations: one on Jeju Isl. (Song & Paik, 1970a), two on Geoje Isl. (Song & Paik, 1970b), one on Mt. Jiri (Song & Paik, 1971), two on Mt. Sopaik (Song & Paik, 1973), and four on Mt. Palgong (Hong et al., 2001). These are distinguishable species from isolated regions and mountains. These are distinctive by the male pore region and spermathecal shape, especially species with two pairs of spermathecae. The regular

occurrence of endemic species with restricted distributions suggests that more species yet could be expected from other islands and mountain regions including North Korea. The holotypes and paratypes of the new species are deposited in the collection of the Jeonbuk National University; some paratypes are deposited at the Museum of Natural History of Geneva.

DESCRIPTIONS

Amynthas gyeryongensis sp. n.

Figs 1A-C

Material: Holotype and 5 paratypes: Chungcheongnam-do, Gongju-gun, Mt. Gyeryong, 28-31 August 1971, Eup-Dong Yeo coll. Other material: Same data as for holotype, 10 clitellate specimens.

Etymology: The species is named for its type locality.

Diagnosis: Spermathecal pores in 5/6 and 6/7, bright white spots at leading edges of vi and vii. Male pores within small equatorial invagination within approximately circular thickened areas, each with large postsetal, laterally placed circular genital papilla.

Description: Brown dorsal pigment. Dimensions 66-108 by 3.8-5.1 mm at segment x, 3.9-5.0 mm at xxx, 3.9-4.8 mm at clitellum; body cylindrical throughout, segments 53-88. Setae regularly distributed around segmental equators, numbering 50 at vii, 51 at xx; 12-15 between male pores, size and distance regular; setal formula AA:AB:YZ:ZZ = 3:2:2:5 at xiii. Female pore single in xiv, 0.3 mm, round shaped. First dorsal pore 12/13. Clitellum annular xiv-xvi, setae and dorsal pores not visible externally within clitellum.

Male pores within small equatorial invagination within approximately circular thickened areas, each with large postsetal, laterally placed circular genital papilla. Each male pore with 2 small round papillae within the shallow male pore invagination. Spermathecal pores in 5/6 and 6/7, bright white spots at leading edges of vi and vii, just below mid-lateral. Genital markings absent.

Septa 5/6-7/8 thin, 8/9, 9/10 absent, 10/11-13/14 thin. Gizzard globular in viii-x. Intestine begins in xv, lymph glands absent. Typhlosome absent. Intestinal caeca simple, originating from xxvii, extending anteriorly to xxv, each consisting of a finger-shaped sac. Three pairs of esophageal hearts in xi-xiii, ix lateral, x lacking.

Ovaries in xiii. Paired spermathecae in vi and vii; each ampulla large pouch, irregularly shaped, ducts about 1/2 ampulla length, diverticula coiled and kinked with short slender muscular stalk, some longer than ampulla; no nephridia on spermathecal ducts. Male sexual system holandric, testes and funnels in ventral paired sacs in x, xi, testes sacs are joined ventrally. Seminal vesicles large, 2 pairs in xi, xii. Prostates xviii within xvii-xx; ducts thick, medium size, both glandular portions consisting of 2-3 main lobes. Genital papillae within male pore invagination with small sessile glands near prostatic ducts, but lateral genital papillae glands not found.

Remarks: The present species appears to be closely related to *Amynthas piagolensis* Hong & James, 2001 according to the male pore region, but is separated easily by the genital papillae. Genital papillae of *A. piagolensis* are presetal, as opposed to postsetal in *Amynthas gyeryongensis* sp. n. Also, *Amynthas gyeryongensis* sp. n. has one more pair of genital papillae near the male pores.

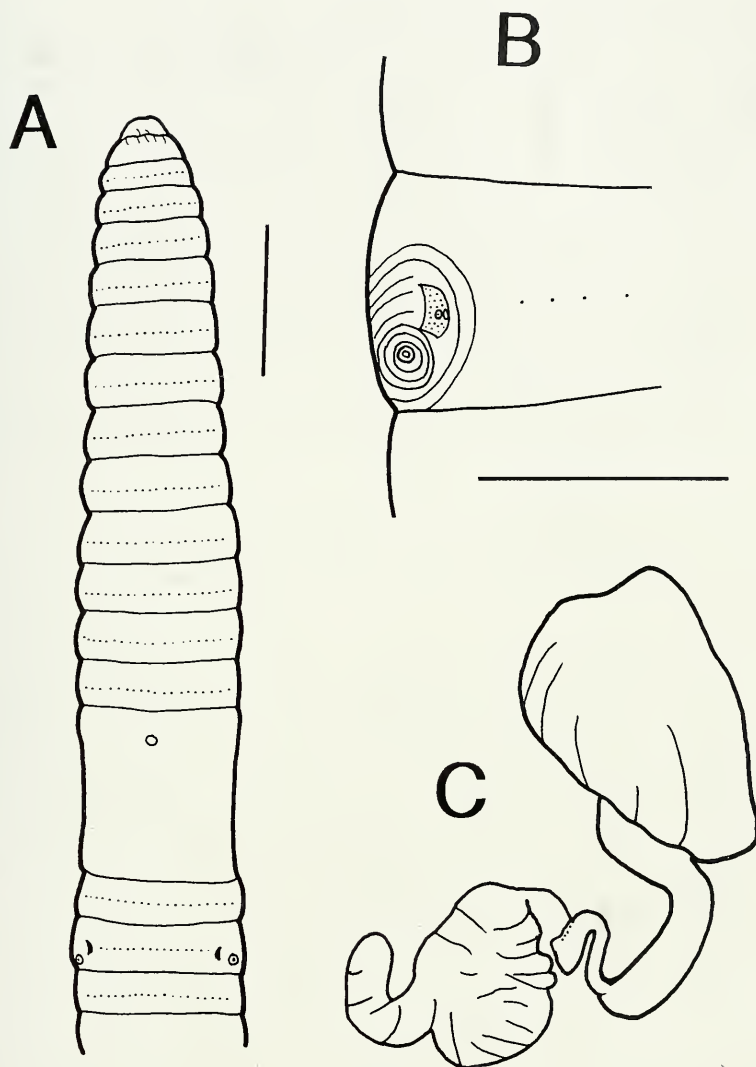


FIG. 1

Amynthus gyeryongensis sp. n. A: ventral view; B: male pore region in xviii; C: spermathecae. Scale bars = 5 mm (A), 2 mm (B, C).

Amynthus gongjuensis sp. n.

Figs 2A-C

Material: Holotype: Chungcheongnam-do, Gongju-gun, Mt. Gyeryong, 28-31 August 1971, Eup-Dong Yeo coll.

Etymology: The species is named for its type locality.

Diagnosis: Spermathecal pores ventro-lateral, equatorial on vi and vii. Male pores xviii in large circular papillae diameter 1.0 mm within rounded triangular thickened area; extending from 17/18-18/19, paired oval genital papillae 18/19 in line with male pore papillae.

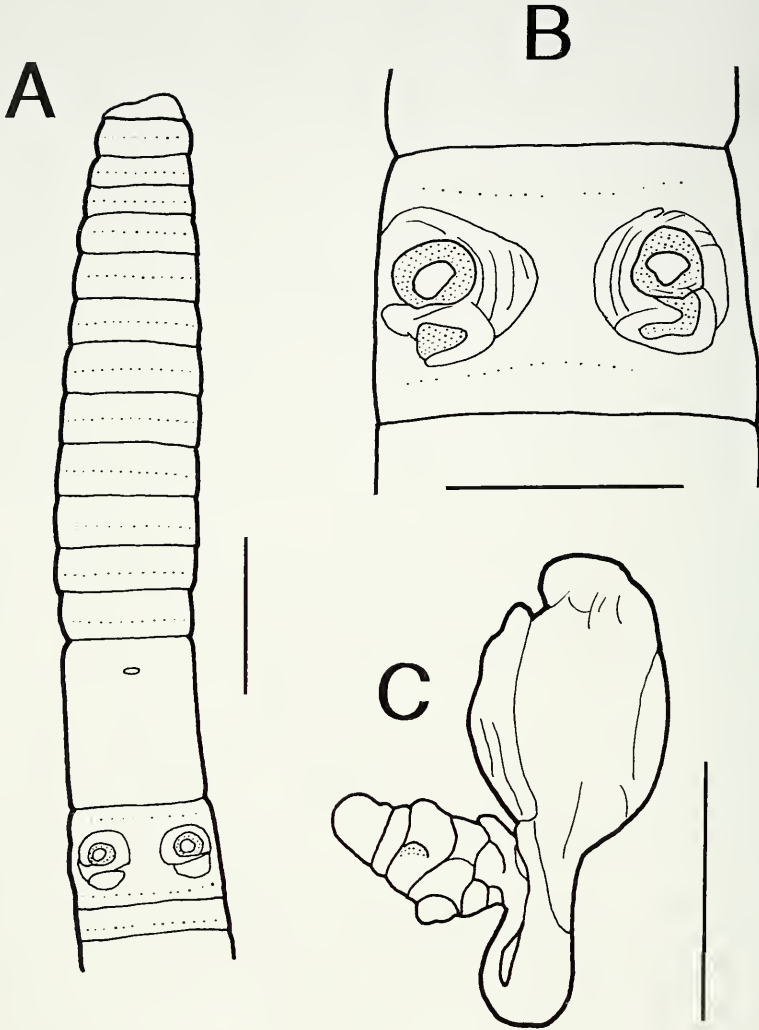


FIG. 2

Amynthus gongjuensis sp. n. A: ventral view; B: male pore region in xviii; C: lateral view. Scale bars = 5 mm (A), 3 mm (B), 2 mm (C).

Description: Brown dorsal pigment. Dimensions 104 by 4.5 mm at segment x, 4.0 mm at xxx, 4.0 mm at clitellum; body cylindrical throughout, segments 106. Setae regularly distributed around segmental equators, numbering 47 at vii, 58 at xx; 3 between male pores, regular distance; setal formula AA:AB:YZ:ZZ = 3:2:2:4 at xiii. Female pore single in xiv, 0.6 mm, oval shape. First dorsal pore 12/13. Clitellum annular xiv-xvi; setae and dorsal pores not visible externally within clitellum.

Male pores xviii in large circular papillae diameter 1.0 mm within rounded triangular thickened area 1.6 x 1.8 mm; extending from 17/18-18/19, paired oval gen-

tal papillae 18/19 in line with male pore papillae. Spermathecal pores ventrolateral, equatorial on vi and vii; very small. Genital markings absent.

Septa 5/6-7/8 thin, 8/9, 9/10 absent, 10/11-13/14 thin. Gizzard globular in viii-x. Intestine begins in xv, lymph glands small from xxx. Typhlosole low simple fold from xxvii. Intestinal caeca simple, originating from xxvii, extending anteriorly to xxiii, each consisting of a large finger-shaped sac. Hearts x-xiii esophageal, ix lateral.

Ovaries in xiii. Paired spermathecae in vi and vii; each ampulla medium sized ovate pouch, thick muscular ducts; diverticula with long slender muscular stalk, ectal tightly coiled section of chamber, ental loosely coiled section of greater diameter; no nephridia on spermathecal ducts. Male sexual system holandric, testes and funnels in paired sacs in x, xi, both sacs joined dorsally and ventrally; enclosing hearts x, xi; enclosing seminal vesicles xi. Seminal vesicles 2 pairs in xi, xii, with dorsal small appendages. Prostates xviii within xvi-xx; ducts short, thick, both glandular portions consisting of 2-3 main lobes, each lobe divided into leaflets. Genital papillae glands absent.

Remarks: *Amyntas gongjuensis* sp. n. has a triangular male pore region, which differs from other Korean *Amyntas*. This species has no genital markings and the spermathecal pores are very small, sometimes not seen easily, externally.

Amyntas yeoi sp. n.

Figs 3A-D

Material: Holotype and 5 paratypes: Chungcheongnam-do, Gongju-gun, Mt. Gyeryong, 28-31 August 1971, Eup-Dong, Yeo coll. Other material: Same data as for holotype, 7 clitellate specimens; 5 clitellate specimens from Gyung-sangbuk-do, Chilgok-gun, Gasan-myon, 12 August 1971, Eup-Dong, Yeo coll.; 7 clitellate specimens from Daegu-si, Mt. Palgong, Page-sa, 6 September 1970, Yong-Tae, An coll.; 2 clitellate and 1 a clitellate specimens from Daegu-si, Mt. Palgong, 19 August 1966, Min-Ja, Song coll.; 1 clitellate specimen from Gwangju-si, Mt. Mudeung, 4 October 1971, Ji-Kug, Park coll.

Etymology: The species is named for its type collector.

Diagnosis: Spermathecal pores 6/7 and 7/8 close to mid-lateral, next to distinctly bounded, lip-shaped genital patches, centered slightly below mid-lateral over 6/7 and 7/8. Male field with large horseshoe-shaped raised pads; male pore towards lateral edge of pad; between pads paired 0.3 mm genital papillae with conspicuous invaginated genital papillae pore, presetal in xviii.

Description: Brown dorsal and light brown ventral pigment. Dimensions 128-160 by 8.2-9.8 mm at segment x, 8.6-10.1 mm at xxx, 8.4-9.5 mm at clitellum; body cylindrical throughout, segments 77-107. Setae regularly distributed around segmental equators, but the setae are very small, numbering 55 at vii, 49 at xx; 19-21 between male pores, irregular distance; setal formula AA:AB:YZ:ZZ = 6:3.5:2:6 at xiii. Female pore single in xiv, 0.6 mm, oval surround. First dorsal pore 12/13. Clitellum annular xiv-xvi; setae and dorsal pores not visible externally within clitellum.

Male field with large horseshoe-shaped raised pads; each pad extending from 17/18-18/19 and within a dark hard flat oval, no seminal groove; anterior portion of pad with curved bar marking, posterior medial portion with shorter bar mark; male pore towards lateral edge of pad; between pads paired 0.3 mm genital papillae with conspicuous invaginated genital papillae pore, presetal in xviii. Spermathecal pores 6/7 and 7/8 close to mid-lateral, inconspicuous, very small; next to distinctly bounded,

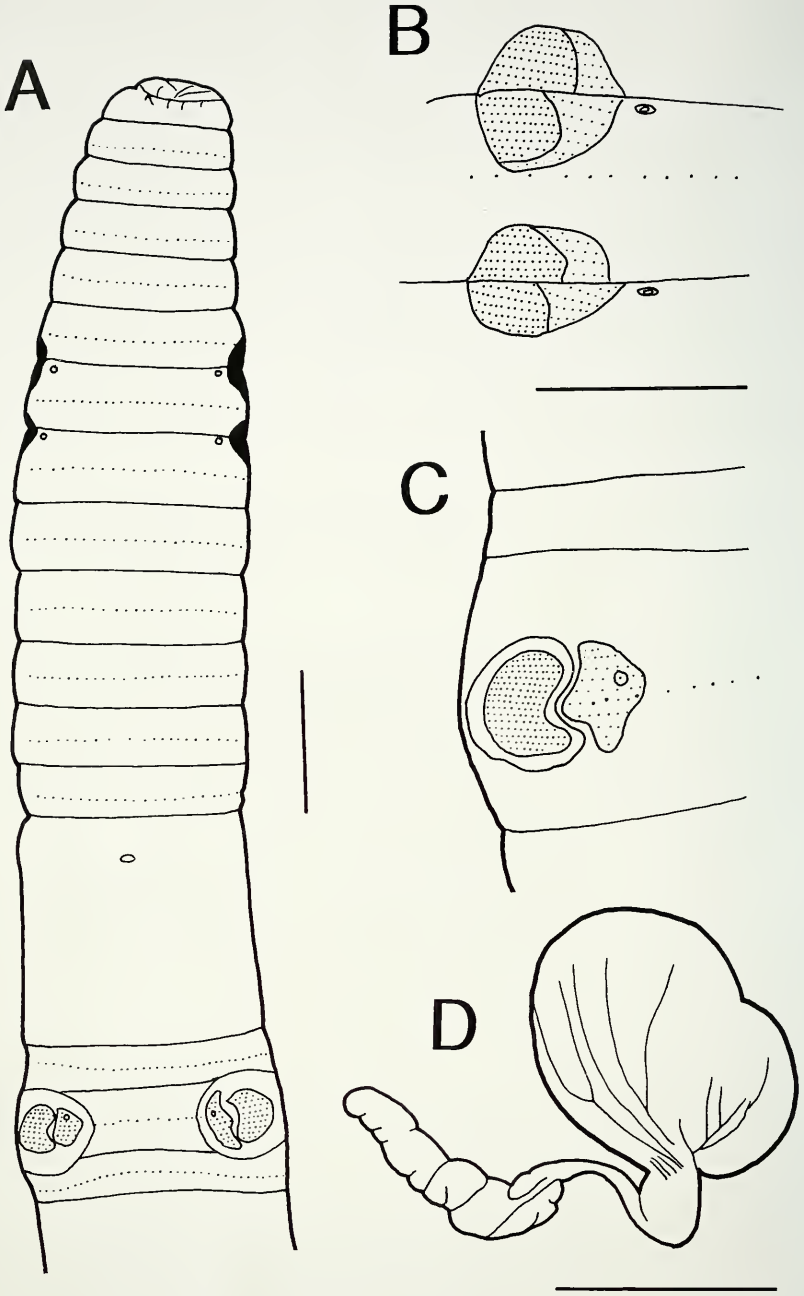


FIG. 3

Amynthes yeoi sp. n. A: ventral view; B: spermathecal pores; C: male pore region in xviii; D: spermathecae. Scale bars = 5 mm (A), 3 mm (B, C), 2 mm (D).

lip-shaped genital patches, centered slightly below mid-lateral over 6/7 and 7/8, ocher color. Genital markings paired in vii and viii, presetal, median to spermathecal pores, slightly indented, dark circle with central white pore opening.

Septa 5/6-7/8 thick, 8/9, 9/10 absent, 10/11-13/14 thick. Gizzard medium size in viii-x. Intestine begins in xv, lymph glands small from xv. Typhlosole not found. Intestinal cecum manicate, originating from xxvii, and extending anteriorly to xxiii, each consisting of 7-8 finger-shaped lobes. Hearts xi-xiii esophageal, ix lateral, esophagous xii, xiii vascularized, with low lamellae.

Ovaries in xiii. Paired spermathecae in vii and viii; each ampulla with a large broad pouch with furrows, ducts short, muscular with 90° bend to ectal narrow portion with muscular stalk, diverticula with straight muscular stalk, longer than ampulla; no nephridia on spermathecal ducts. Genital marking glands of vii and viii single or branched into 2 or 3 lobes. Male sexual system holandric, testes and funnels in ventrally joined paired sacs in x, xi. Seminal vesicles 2 pairs in xi, xii. Prostates xviii very large within xvi-xxiii; ducts thick, short, muscular; both glandular portions consisting of 3-4 main lobes. Genital papillae of xviii each with one large stalked gland.

Remarks: The present species is similar to *Amyntas jiriensis* (Song & Paik, 1971) by the genital markings and genital patches of the spermathecal pore region, but it differs from it in the shape of the genital patches and male discs. This species has genital patches in the posterior regions of vi and vii, while *A. jiriensis* has them only anterior regions of vii and viii.

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